

A casual perusal of the Report of the Committee on Social Betterment of the President's Homes Commission explains why such a loud howl went up when the report was presented to the Congress. Some fifty or sixty pages of this volume are devoted to nostrums, "patent medicines" and fake "cures," and this, quite naturally, was found objectionable to a number of our most honorable members of Congress who are interested, or whose friends are interested in many of these fakes. There are, for instance, 38 preparations listed which contain habit-forming drugs (opium, morphine, cocaine, etc.). A study of 1,217 families in the city of Washington disclosed the fact that they spent \$2,032.39 per annum for "patent or proprietary medicines" and from this it is deduced that not less than \$62,000,000 are spent annually in the United States for this purpose; which is no insignificant sum, by the way. We learn from the report that the patent office has issued, up to October 31st, 1908, 2,140 patents and 8,398 trademarks on drugs, chemicals and medical compounds. Referring to the Council on Pharmacy and Chemistry of the A. M. A., the report says: "*This Council has rendered, and will continue to render, most meritorious services to the cause of humanity.*" (And this is the work—these "meritorious services"—which the Proprietary Association, with the assistance of Lydston, of Chicago, is trying in every way to stop or undo.) The soothing syrups are given a dose of truth and a few deaths are cited; in passing, one but wonders if any Congressman is interested in soothing syrups. Diphtheria cures, drunk cures, consumption cures, catarrh cures, skin cures, rheumatism cures, cancer cures, epilepsy cures and abortifacients are given a most dignified, polite and official send off into the realms of fraud and criminality—and this from an official, government publication! Ye Gods and little fishes! No wonder that the honorable Congressmen howled! No wonder that there was a protest against the circulation of this report! No wonder, also, that the files were exhausted within the first two days, that no more copies are to be had except those in the hands of the Commission. The work of the American Medical Association and the work of *Collier's Weekly* have at last received the endorsement of a special Commission appointed by the President of the United States. Does it matter much what the Lydstons or the Proprietary Associations have to say? Think about it.

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#### ANTISEPSIS AND ASEPSIS IN SURGERY.\*

By W. W. BECKETT, M. D., Los Angeles.

From the wide range of subjects, for a brief address before this society, it seemed to me that I could select none more appropriate than the title of this paper.

Lister more than forty years ago first recognized and put into practice the principles which underlie all modern wound treatment.

In literature and in science there have been occasional startling and unforeseen bursts of progress. These epoch-making periods have not been confined to literature and science alone. There stand out in the past history of our art of surgery three great epochs. One was when Pare, a French barber-surgeon, about the middle of the sixteenth century substituted the ligature for the red-hot knife, the actual cautery and boiling oil; the second when Morton demonstrated that human beings could be painlessly operated upon under the influence of an anesthetic; and the third and greatest when Lister introduced the antiseptic principle in wound treatment.

Lucas Championniere was right when he said that there are only two periods in surgery. One before Lister and one after Lister.

Antiseptic surgery has been defined as surgery directed against sepsis, or against septic organisms, which have already entered the wound, the aim being the eradication of these organisms from the wound; and aseptic surgery as surgery in which means were taken to prevent the entrance of pathogenic organisms into the wound. We now employ these terms—"Antiseptic" and "Aseptic" surgery quite differently—antiseptic surgery being methods of wound

\* President's Address, Thirty-Ninth Session of the State Society, San Jose, April, 1909.

treatment in which antiseptics are used and aseptic surgery being methods where no antiseptics are used.

Before Lister had commenced his bacteriological work in connection with antiseptics, medicants used in wound treatment had been used more or less empirically, believing that the union depended upon the virtues of the balsams, lotions, liniments, ointments and other local applications. Lister based his treatment of wounds upon the researches on fermentation by Pasteur. Carbolic acid at this time was used as a local dressing for wounds to lessen the discharge and fetor of suppurating surfaces. Lister taught that its beneficial influence was due to its germicidal action, and its consequent power against the sources of disturbances which existed in the dust of the surrounding air.

It is hard to realize the changes brought about by antiseptic and aseptic surgery. The terrors of the surgical practice of those former days, before Lister, such as unavoidable suppuration, pyemia, septicemia, erysipelas, tetanus and hospital gangrene, are so rare now, that some of them, notably hospital gangrene, can now safely be said to not exist. It is said that in those pre-Listerian days eighty per cent of all wounds treated in Nussbaum's clinic in Munich were attacked with hospital gangrene. Erysipelas was a common occurrence. Open wounds were not sutured lest the retention should encourage erysipelas. Healing by primary union did not exist. Eleven out of seventeen patients subjected to amputation died of pyemia. It was customary to perform amputation immediately for compound fractures, otherwise purulent infection, hospital gangrene, or septicemia led to a fatal termination in a few days. The usual rate of mortality in compound fracture was forty per cent. In St. Petersburg the mortality rate reached sixty-eight per cent. In major amputations the mortality was about thirty-three per cent. The operating room was frequently crowded with students fresh from the dissecting-room. Each ward has its set of sponges, and these were used indiscriminately for dressing the wounds, and at the operating table. There was no such thing as absorbent cotton in those days. Lint was used instead. Linseed meal and charcoal poultices were used to cleanse and sweeten wounds and to promote "healthy suppuration." "Laudable pus" was a sign of a healthy condition of the wound. Stout silk ligatures were employed to tie blood-vessels and were left hanging out of the wound to be pulled at from time to time until they were separated by the process of suppuration. What a change has taken place since that time. Dennis reports one thousand cases of compound fracture treated by himself with a mortality of less than one-half of one per cent. The death rate from sepsis in clean cases, in our best hospitals, is to-day almost nil.

The doctrine of the four elements, earth, air, fire and water, constituted the sole dictum of the ancient philosophy which under the designations of heat, coldness, dryness and moisture were thought to explain the various phenomena of disease. Air was supposed to play the most important part in

the production of disease. Hippocrates taught that air entered the different cavities of the body and produced pain and every known malady. According to Hippocrates, the gas expelled from the stomach was nothing more nor less than atmospheric air. The same air when charged with miasm might enter the system and poison it, giving rise to many diseased conditions. The difficulty of healing all open wounds he considered to be due to the coldness of air. Magnatus as early as 1576 advanced the view, that the air was charged with miasms which infected every part of the human system wherever they might find entrance. He noticed if a hole was made in the end of a new-laid egg through which air was permitted to enter, the contents of the egg was sure to undergo putrefaction. From this simple experiment he argued that the inflammation and suppuration seen in all open wounds was due to their exposure to the open air. He did not specify any particular constituent of the atmosphere, but thought the air was the carrier of the poison. Ambrose Paré called attention to the poisonous properties of the air of sick-rooms and camps. That atmospheric air caused all the trouble in external wounds became the recognized belief of the day, and from that time on the chief care of the surgeon was to exclude the air from all such injuries as much as possible. Surgeons had recognized the fact that simple fractures, dislocations and all wounds where the surface remained unbroken, healed very rapidly, with little inconvenience and small risk to life, while in compound fractures and where the air had free access to the injury, inflammation and suppuration were sure to follow. In 1783 Benjamin Bell, an English surgeon, first drew attention to the evil effects of admitting air into open abscess cavities, and advised the use of drainage tubes for evacuating their contents, without permitting the ingress of air. Delacroix improved on the method of Bell by inventing the aspirator. John Hunter, the celebrated Scotch surgeon, considered that the healing of wounds by scabbing was the natural process. Many mechanical appliances were used to assist Nature in this scabbing process. Layers of cotton, dried blood, anything that would cover the wound and exclude the air was made use of. Lister in his search for some satisfactory substitute for this natural process of scabbing was led to discover the true principle of antiseptic surgery. He first used lint saturated with carbolic acid and blood to form a coating over the surface of the wound. Sheets of lead or block tin were firmly fixed over the application to prevent the evaporation of the carbolic acid.

Before the invention of the microscope it was impossible to determine whether or not the air contained any living organisms. Pasteur in 1857, after a series of brilliant experiments, established the fact that it was not the air as a whole or any of its constituent parts which disturbed the healing process of wounds, but minute living organisms conveyed by the air.

Other eminent men through varied experiments confirmed the conclusion of Pasteur. In 1867 Sir

Joseph Lister first published his procedure in the treatment of open wounds by the new or antiseptic method. In March of the following year Lister began to treat wounds by this new method. His first cases did not come up to his expectations, yet he did not become discouraged, but continued the treatment with more care and was soon able to prove that by this method of treatment of compound fractures, the danger from subsequent suppuration was not only obviated, but a cure was hastened. He also extended this form of treatment to abscesses. His object was to evacuate the pus without admitting air. He prepared a twenty-five per cent solution of carbolic acid and boiled linseed oil. With a bistoury whose blade had been dipped in this solution, he opened the abscess. A piece of cloth which had been saturated with this carbolicized oil was placed over the opening and the contents of the abscess pressed out beneath the cloth. After the hemorrhage was checked, a piece of lint saturated with the antiseptic oil was placed as a drain through the opening into the abscess. The wound was dressed so as to exclude the air and to promote the process of scabbing. This treatment was followed in incised, punctured, lacerated and contused wounds, and finally to amputations and all the different branches of operative surgery. Professor Paget, a distinguished contemporary, said: "The covering of a wound, as in a compound fracture, with material soaked in a solution of carbolic acid, excludes all the external air, or at least those organic materials in it that would be injurious. Thus the wound is rendered practically airtight and may heal without suppuration, simply by scabbing over."

Lister had two objects in view, to keep the morbid organisms in the air from coming in contact with the wound, and to destroy those that had already found entrance. This was the last step in the evolution of antiseptic surgery.

Buried ligatures were first used in 1867. Lister first experimented by tying the left carotid artery of a horse with silk which had been steeped in a strong solution of carbolic acid, the ends cut short and the wound dressed antiseptically. Healing occurred without suppuration. Six weeks afterwards the horse died and the parts were examined. The vessel was completely cicatrized. A few weeks afterwards he tied the external iliac artery in an old lady suffering from an aneurysm of the femoral artery. In this case he used silk soaked in carbolic acid. The wound healed primarily. At autopsy about one year after, the knot was still present, enclosed in a thin walled capsule. The use of animal ligatures was next tried. Leather catgut and tendon had been used and abandoned, but it was hoped with antiseptic methods better results might be obtained. In 1868 Lister ligated the right carotid of a calf with catgut that had been soaked in carbolic acid for four hours. The wound healed by first intention. A month later the calf was killed. On dissection the catgut was found to be absorbed.

Following out the same antiseptic principle, the carbolic acid spray was used to avoid the risk of

air infection. About the same time antiseptic gauze was used for dressings, and rubber drainage tubes were employed. From this time on there was a gradual advance up to the present methods of wound treatment.

The excessive use of antiseptics and moist dressings produced a great deal of wound irritation and proved in many cases to be very unsatisfactory. This soon led to sterilization by heat and the use of dry sterilized gauze for dressings. Lister was probably the first to use dressings sterilized by heat. Lister, till he gave up operating in 1896, continued the same method of skin sterilization that he had adopted thirty years before. This consisted in washing the skin just before the operation with a 1 to 20 watery solution of carbolic acid. He used a 5 per cent solution of carbolic acid for hand disinfection and for the sterilization of instruments. The instruments were placed in this solution just before the administration of the anesthetic. These are very simple methods when we compare them with the technic which is now in general use. To attain the best results it is necessary to have a well-appointed hospital and a permanent staff of assistants. Then a definite system can be carried out, and in a large series of consecutive cases, if the results are not satisfactory, it is possible to locate the cause of failure and to make such changes as may be necessary to bring about better results. The more simple the method the better, if it is effectual. As far as possible there should be a uniform system practiced by the surgeon, assistants and nurses. It is only in well-appointed hospitals that this can be carried out. The surgeon is to a great extent dependent upon the care and thoroughness with which others do their work. He cannot supervise every detail. He is at the mercy of those in subordinate positions, whose lack of knowledge or carelessness may defeat his best endeavors. He must take for granted that their work is carefully and scrupulously done.

Aerial infection has been a much-discussed subject from the time Lister introduced his carbolic spray to the present time. As to the danger of air infection, there is a difference of opinion on the part of those who have investigated the subject.

Investigations made of surgical amphitheatres of different hospitals by the exposure of Petri plates do not differ materially as to the variety and number of bacteria present in the air. They all show that air infection is a possible danger and should not be disregarded.

It has been recently stated that sweat is never sterile, yet it has been demonstrated by Harrington that sweat made to flow from well cleaned, and as far as possible, sterilized hands and forearms, encased in sterile glass cylinders, and heated by appropriate means, that not in a single instance could a bacterial growth be obtained.

There is much greater danger through saliva from talking into the wound. Dr. Charles Harrington says: "The mouth cavity is a singularly unclean place, for the secretions of the mouth are

likely to be richer in bacteria than the foulest sewage, and they may be exceedingly virulent."

The details for aseptic operations vary according to the ideas of the individual surgeon. The following are the methods we have pursued during the past several years. Street clothes are removed in dressing rooms and replaced by duck suits and tennis shoes. Everything that is brought into the operating room is sterilized either by boiling or steam heat under pressure. Gauze dressings, sponges, pads, gowns, sleeves, towels, sheets and caps are exposed in a steam sterilizer at eighteen pounds pressure for three-fourths of an hour. Sterile catgut and kangaroo tendon are purchased from some reliable dealer. The floor of the operating room is thoroughly mopped and the walls, furniture and fixtures wiped with moist cloths. The operating room is thoroughly fumigated with formalin after septic cases. Draughts are minimized. Septic material is thrown into a well-trapped hopper with sufficient disinfectants. Clean cases always precede septic ones.

The patient, the day before operation, is given a full warm bath and the operating area is shaved and thoroughly cleansed with soap and water. Sterile gauze is used instead of a brush for this purpose. A sterile gauze pad is placed over the seat of operation and held in place by a suitable bandage. When the patient is placed on the operating table, the operating area is thoroughly sponged with Harrington's solution and then gently scrubbed with alcohol. The hands and arms of surgeon and assistants are thoroughly scrubbed with hot running sterile water and soap; sterile gauze being used for scrubbing instead of a brush. Nails are trimmed and cleaned and hands again washed until satisfied they are clean. They are then immersed in Harrington's solution for about thirty seconds and then rinsed in alcohol. Next they are rinsed with a bichlorid solution, 1 to 5000, and the gloves put on. Thin rubber gloves are used in all operations and for dressing wounds. The gloves are sterilized by boiling or by steam heat under pressure. Gloves undoubtedly lessen the danger of infection and prevent the hands from becoming soiled with septic material. Silk wormgut, silk, pagenstecher thread, wire, and all instruments, except cutting instruments, are sterilized by boiling for ten minutes. Edged instruments and needles are immersed in lysol for ten minutes. Caps are worn to prevent dust, dandruff and bacteria from being brushed off into the wound. Sleeves are pinned to the gown and a sterile towel over the front of the gown. These are changed after each operation. Gauze is worn over the nose and mouth. The hands and instruments are frequently washed in warm sterilized salt solution during the operation. All drains are sterilized by boiling, except rubber tissue, which is soaked in bichloride 1 to 1000 and afterward washed off with sterile salt solution.

Great care is taken in the cleansing of all open wounds, especially those of compound fractures. The skin surrounding the wound is thoroughly scrubbed with soap and sterile water, then sponged

with Harrington's solution and washed off with alcohol. The wound is washed out with sterile salt solution, all foreign substances removed and then thoroughly washed with a 10 per cent solution of lysol; the bleeding checked so as to leave the wound as dry as possible and the wound closed. Drainage is employed if there is any oozing or where cavities exist. Abscesses are drained and the cavities filled with a two per cent solution of formalin in glycerin.

In clean cases the wound is dressed with dry sterilized gauze, which is held in place with adhesive plaster or suitable bandages. The wound is dressed the fourth day and the superficial stitches removed. The retaining sutures are removed the eighth day.

We realize that these methods are not perfect, but if they are religiously carried out, good results will be obtained.

#### REFERENCES.

- Chevne, *The Lancet*, Feb., 1903.  
 Griffith, *the Lancet*, Aug., 1903.  
 Lockwood, *British Med. Journal*, Feb. & March, 1904.  
 Clark, *Med. and Historical Journal*, Sept., 1907.  
 Cameron, *British Med. Journal*, April, 1906.  
 Lister, *the Lancet*, June, 1908.  
 Ochsner, *Annals of Surgery*, Oct., 1904.  
 Monks, *Annals of Surgery*, Oct., 1904.  
 Harrington, *Annals of Surgery*, Oct., 1904.

#### AMEBIC DYSENTERY.\*

By J. D. LONG, Passed Assistant Surgeon U. S. P. H. & M. H. S.

Heretofore Amebic Dysentery has been considered almost entirely a disease of tropical countries; it is true that during the past ten years, isolated cases have been reported by observers in various portions of the United States, e. g., Baltimore, Chicago, St. Louis, New Orleans and also in Montreal, Canada, and while it seemed to the observers that these cases had in some unexplainable way originated in the cities where found, there still lingered the feeling that they had really in a more or less roundabout way gotten their infection from the tropics.

In 1907 while on duty at the U. S. Marine Hospital, the writer found three cases of dysentery which, as far as could be determined from the history of the cases, originated in San Francisco or vicinity; the thought then occurred that probably the disease had secured a foothold here, on account of the large number of persons arriving here each year from countries where the disease is known to be endemic. Before it was possible to study the matter further, other duties intervened and the matter was dropped till last year.

About December 1, 1908, a case of dysentery was admitted to the hospital in a man who had lived continuously in San Francisco and vicinity for a number of years. His symptoms had lasted for less than two years. Routine examination of stools was then begun, with the result that since December 1, 1908, a total of forty (40) cases of dysentery have been found, in all these cases living motile amebae have been demonstrated in the stools, and in some cases other parasites, e. g., trichocephalus dispar, un-

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